

"Brown Stem", A Bacterial Disease of Beans

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"Brown stem", a bacterial disease of beans, has been studied at the Bean Research Laboratory at Twin Falls, Idaho since it was found in 1957. The nature of the causative agent was identified as a species of *Corynebacterium* in 1962. During the period between 1957 and 1962, techniques used to transmit bacteria, fungi, and viruses failed to transmit the pathogen with any degree of consistency. Therefore, symptomology among various bean varieties remained an enigma during this period.

Earlier developments indicated that "brown stem" could be transmitted mechanically from host to host by inoculating leaves of normal plants with macerated green raw pods from diseased plants. However, since a very low percentage of the inoculated plants became infected these inoculation tests were questioned. Bacterial isolates from infected plants and seeds also gave low percentages of transmission. As inoculation techniques were modified, repeated transmissions showed that a gram positive *Corynebacterium* species isolated from seed and pods of infected plants could cause "brown stem" of normal bean seedlings.

Each year since 1957 "brown stem" has been observed more frequently in both snap and dry bean types. Field grown bean plants infected with the "brown stem" pathogen will produce the disease in up to 100 percent of the seeds germinated in the greenhouse. Typical symptoms of "brown stem" usually appear at the flowering stage as minute yellow-brown necrotic lesions on the leaves and stems. It seldom manifests symptoms in the nodal area. The first symptoms on pods consist of small circular water-soaked spots which often coalesce; later these water-soaked spots become reddish-brown necrotic lesions. Since the symptoms of this disease, under southern Idaho conditions, are easily confused with red node, red spider damage, various physiological disorders, and perhaps strains of yellow mosaic of beans, seeds of plants suspected of having "brown stem" are grown in the greenhouse.

Symptoms of "brown stem" have been observed in the following bean varieties: Topcrop, Wade, Red Mexican, Blue Lakes, Bountiful, Pinto UI-111 and Great Northern UI-31 under field conditions.